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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,991	07/21/2006	Carin Vorde	P71362US0	9238

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EXAMINER	
CHAN, HENG M	

ART UNIT	PAPER NUMBER
1793	

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07/29/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/586,991	VORDE ET AL.	
	Examiner	Art Unit	
	HENG M. CHAN	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 June 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 16-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 16-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/29/2009 has been entered.

Claim Objections

2. Claims 1, 21, and 22 are objected to because “nitration of” in line 3 of each claim should be changed to "nitrating". Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1 and 16-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,976,483 to Langlet et al. (herein after Langlet I), in view of US 6,291,711 to Langlet (herein after Langlet II) and US 4,559,409 to Seyerl.**

Regarding claims 1, 16-22, and 34, Langlet I teaches a method of producing a salt of dinitramidic salt (column 1, lines 4-14, 52-67), comprising:

- Nitrating an initial compound, e.g. ammonium sulfamate (Example 7), with a nitrating acid mixture, the nitrating acid mixture comprising nitric acid/sulphuric acid (NH_3/H_2SO_4) to form a dinitramidic acid in an acidic reaction mixture;
- Mixing and reacting a neutralising agent with the reaction mixture, forming the salt of dinitramidic acid;
- Precipitating the salt of dinitramidic acid from the acidic reaction mixture, which is acidic at the time of precipitation; and
- Separating the precipitate from the reaction mixture.

Langlet I suggests that the neutralizing agent can be made of a number of formulae, one of which is a salt **AX**, wherein **A** is a metal ion or a nitrogen-containing cation (see column 2, lines 45-46) such as guanidium ($C(NH_2)_3^+$) and triamino guanidinium ($C(N_2H_3)_3^+$) (see column 3, lines 21-22).

Langlet I does not expressly teach adding a guanylurea ion, cyanoguanidine, or guanylurea nitrate as a neutralizing agent to the reaction mixture to make guanylurea dinitramide.

Langlet II discloses that guanylurea dinitramide can be used for many purposes: an explosive, especially propellants; a pressed rocket motor charge; and a gas-generating component in gas generators for vehicle safety equipment, such as airbags

(abstract). Langlet II teaches that a guanylurea salt is used to make guanylurea dinitramide in Examples 1 and 2.

Seyerl teaches reacting dicyanodiamide (same as cyanoguanidine), in the form of a solution or suspension, with sulfaminic acid (NH_2SO_3H) in an aqueous or organic-aqueous medium to form the corresponding guanylurea salt, e.g. guanylurea nitrate (abstract; column 1, lines 45-47; claim 1).

It would have been obvious to one of ordinary skill in the art at time of invention to have modified the method provided by Langlet I, by adding a source of guanylurea ion, e.g. a guanylurea salt such as guanylurea nitrate or an aqueous slurry of cyanoguanidine which is hydrolyzed by acid to form protonated guanylurea *in situ*, to the acidic reaction mixture in order to obtain the precipitate, guanylurea dinitramide, motivated by the fact that the skilled artisan would have obtained expected results by substituting a neutralizing agent, such as guanidium disclosed by Langlet I, with the guanylurea ion formed in situ as suggested by Seyerl, because the neutralizing agent and the guanylurea ion are both protonated in the aqueous acidic reaction mixture and act as the stabilizing nitrogen-containing cation for the negatively charged dinitramidic acid. The skilled artisan would have also appreciated making guanylurea ion from cyanoguanidine to permit a much higher yield and purity of the corresponding guanylurea salt by comparison with previous methods (see column 2, lines 33-37) and that the optimized level of guanylurea ion in the reaction mixture would help maximize the yield of the desired guanylurea dinitramide salt.

Regarding claims 23-27, Langlet I teaches that a dinitramide salt, ADN, for example, can be prepared from another dinitramide salt like KDN (see column 4, lines 6).

Langlet I does not expressly teach that the guanylurea dinitramide is used as a starting material for the preparation of other dinitramide salts.

However, it would have been obvious to one of ordinary skill in the art at the time of invention to have used a known dinitramide salt, i.e. guanylurea dinitramide, in place of another in the method of Langlet I, motivated by the fact that the skilled artisan would have appreciated using the simple ion exchange process to make various dinitramides, for example, ADN, a high performance oxidizer.

Regarding claims 28-33, Langlet I teaches that KDN is recovered from the aqueous solution and re-used in the production of another dinitramide salt, ADN (column 6, lines 48-53).

Langlet I does not expressly teach that the added guanylurea ion is recovered and is re-used in the production of dinitramide salts.

However, it would have been obvious to one of ordinary skill in the art at time of invention to have recovered and reused the added guanylurea ion for making dinitramide salts in the method provided by Langlet I, motivated by the fact that the skilled artisan would have appreciated recovering and reusing materials from the remaining reaction mixture in an environmentally friendly and economical way.

Response to Arguments

5. Applicant's arguments with respect to claims 1-9 and 14-15 filed 6/29/2009 have been considered but are moot in view of the new ground(s) of rejection.

6. Regarding the pending claim 1, Applicant argues in the second and third paragraphs of page 8 that Langlet I does not teach or disclose the use of guanylurea ions and thus cannot anticipate the claims.

In response, the Examiner has withdrawn the § 102(b) rejection. The amendment necessitated a new ground of rejection; the pending claim 1 is now rejected under § 103(a) as unpatentable under Langlet I, Langlet II, and Seyerl (see rejection above).

7. Applicant argues in the second paragraph of page 9 that a person skilled in the art would not have chosen to use guanylurea or a protonated form thereof.

However, Langlet I specifically teaches using neutralizing agents containing a nitrogen-containing cations. The skilled artisan would have recognized that guanylurea is a nitrogen-containing cation (i.e. protonated) in an acidic medium and thus can be in place of the nitrogen-containing cations disclosed by Langlet I to make a dinitramide salt. The skilled artisan would have been interested in making guanylurea dinitramide for its utilities disclosed by Langlet II. The skilled artisan would have searched and obtained the efficient way of preparing guanylurea dinitramide by providing the guanylurea ion using Seyerl's method to maximize the purity and yield of the corresponding guanylurea salt, which would optimize the yield of the guanylurea dinitramide.

Applicant argues from the third paragraph of page 9 to the first paragraph of page 10 that “a person skilled in the art with knowledge of Langlet I who was considering the problem of recycling of the reaction mixture and reprocessing of the reaction mixture in an environmentally friendly and economical way would have been lead to the step of neutralizing the pH to a value to pH 7 ± 1 instead of keeping the acidity well below this value.”

The Examiner quotes Applicant from the last line of page 8 to the first paragraph of page 9: “Use of guanylurea ions in the presently claimed process is critical. This is because use of guanylurea ions permits recycling of the reaction mixture and reprocessing of the reaction mixture as an acid, because the guanylurea dinitramide that is formed is stable in the acid environment and is precipitated directly from the acid reaction mixture without neutralization of the reaction mixture. Thus, the use of guanylurea ions solves the problem with recycling and reprocessing of the reaction mixture in an environmentally friendly and economical way.” It appears that the Applicant made the point that the skilled artisan with knowledge of Langlet I would have used guanylurea ions, if it was the skilled artisan’s interest to resolve the problem of recycling and reprocessing the reaction mixture in an environmentally friendly and economical way.

Applicant quotes Langlet I that working at low pH's cannot be done as the formed dinitramidic acid is unstable in an acid environment. See, column 2, rows 22-25.

The Examiner points Applicant's attention to the fact that that quote refers to the nitrating step of the process and Langlet I teaches that because the formed dinitramidic

acid is unstable in an acid environment, the nitrogen-containing neutralizing agent is added to make a dinitramide salt (column 2, lines 31-34). Since the Applicant appears to agree that the skilled artisan with knowledge of Langlet I would have used guanylurea ion for the benefits and recycling and reprocessing the reaction mixture, this further accentuates the advantage of using guanylurea ion with respect to stabilizing the dinitramidic acid.

Finally, Applicant argues in the last paragraph of page 10 and first paragraph of page 11 that Langlet I and Langlet II teach very different processes because they used different acids and pH's.

The Examiner respectfully disagrees. Applicant is comparing a nitrating step of Langlet I that would result in dinitramidic acid, not the dinitramide salt, to a step of dissolving guanylurea dinitramide in acidic water in Langlet II. These process steps are not comparable.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HENG M. CHAN whose telephone number is (571)270-5859. The examiner can normally be reached on Monday to Friday, 8:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571)272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J.A. LORENGO/
Supervisory Patent Examiner, Art Unit 1793

/HENG M CHAN/
Examiner, Art Unit 1793